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1985 Insect Pest Management Guide

LIVESTOCK and LIVESTOCK BUILDINGS

Successful pest management is an essential part of efficient and profitable livestock production. Although pest-related losses are often inconspicuous, flies, lice, mites, and ticks can cause significant reductions in meat, milk, wool, and egg production. Several livestock pests also transmit important diseases.

Effective management of livestock pests should include the use of cultural, mechanical, and biological control tactics as well as the application of chemical insecticides. Insecticides should be viewed as supplements to, not replacements for, sanitation and sound cultural practices. Used properly, insecticides efficiently reduce pest populations without injuring livestock or threatening the safety of the pesticide applicator or the ultimate consumer of animal products.

This publication is revised annually; always use the current year's issue. Registration changes that occur between revisions will be announced to appropriate media sources and county extension offices. If you have questions about the use of insecticides for livestock insect management, consult your county extension adviser.

Selection of the insecticides listed on the following pages was based on EPA registrations and on efficacy data reported by entomologists of the University of Illinois College of Agriculture, the Illinois Natural History Survey, and other midwestern universities. If listed insecticides fail to provide pest control, please contact your county extension adviser or the Entomology Extension office at the University of Illinois.

Additional sources of information. In the tables, leaflets outlining the life history, biology, and habits of livestock pests are indicated by the letters "NHE" and the leaflet number. Request these leaflets at your county extension office or from Entomology Extension, 172 Natural Resources Building, 607 East Peabody Drive, Champaign, Illinois 61820. Additional pest management publications available from the Office of Agricultural Publications (47 Mumford Hall, 1301 West Gregory Drive, Urbana, Illinois 61801) include Circular 899, *1985 Insect Pest Management Guide: Field and Forage Crops*;

Circular 900, *1985 Insect Pest Management Guide: Home, Yard, and Garden*; Circular 925, *Insect Pests of Cattle*; Circular 897, *1985 Insect Pest Management Guide: Commercial Vegetable Crops and Greenhouse Vegetables*; and Circular 1136, *Alfalfa Weevil Pest Management Program*.

Using livestock insecticides. The pesticide user is always responsible for the results of insecticide applications to his livestock and crops, as well as for problems of pesticide drift and contamination. All users should observe the following rules.

- Read the label and follow directions and safety precautions. **THE LABEL IS THE LAW.**
- Be sure that the insecticide is specifically labeled for the pest and animal in question and the application method planned.
- Use face masks or respirators and protective clothing during spraying. Avoid breathing spray mist or dust.
- If pesticides are spilled on the skin or clothing, wash thoroughly with soap and water and change clothes.
- Do not eat, drink, or smoke when handling pesticides.
- Provide adequate ventilation when applying pesticides.
- Apply correct dosages and formulations.
- Obey the preslaughter interval listed on the label.
- Do not exceed registered rates of application. Improper or excessive applications can endanger livestock and result in illegal residues in meat and milk.
- Avoid drift to adjacent cropland, yards, woodlots, lakes, or ponds. Some materials may injure or kill fish, wildlife, and crops.
- Do not treat animals that are sick, overheated, or stressed from shipping, dehorning, castration, recent weaning, and other causes.
- Avoid contamination of feed, mangers, water, milk, and milking equipment.
- Do not spread treated manure on crops that are not listed on the pesticide label.
- Accurately record all pesticide usage. Include the pesticide's trade name, formulation, dilution, application rate, and date of treatment.

- Store pesticides in their original, labeled containers, safely locked away from children, pets, and livestock.
- Dispose of empty pesticide containers promptly and properly according to specified recommendations. Do not breathe smoke from burning containers.
- Contact a physician at once in all cases of suspected poisoning. Symptoms of organophosphate poisoning include blurred vision, abdominal cramps, and tightness in the chest.

Poison Resource Centers. The Poison Resource Centers listed below have been established to provide information about the treatment of poisoning cases. Anyone with a poisoning emergency can call the toll-free telephone number for help. Personnel at the Resource Center will provide first-aid information and refer callers to local treatment centers if necessary.

Poison Resource Centers supplement, but do not replace, local emergency medical services. Do not delay calling local emergency medical personnel to request immediate assistance or transportation. If possible, have the pesticide container and label present when you call or reach a treatment center or hospital.

Chicago and northeast Illinois

1753 West Congress Parkway
Chicago, Illinois 60612
Telephone: 800-942-5969

Northern and central Illinois

530 N.E. Glen Oak
Peoria, Illinois 61603
Telephone: 800-322-5330

Central and southern Illinois

800 East Carpenter
Springfield, Illinois 62702
Telephone: 800-252-2022

Preventing livestock poisoning. Every year livestock animals die after consuming pesticide granules, wettable powders, or dusts that have been spilled on trucks, wagons, or soil surfaces. Animals consume the pesticide alone or with feed grains or forage placed on the contaminated surface. Prevent livestock poisoning by properly containing and disposing of spilled pesticides and by storing all pesticides in locked facilities that are inaccessible to domestic and wild animals, as well as to children.

NOTE: The information in the following tables is for educational purposes only. Reference to commercial products or trade names does not constitute an endorsement by the University of Illinois and does not imply discrimination against similar products. Trade names are presented for reasons of clarity only. The reader is urged to exercise the usual caution in making purchases or evaluating product information.

Beef Cattle and Nonlactating Dairy Cattle

Pest	Treatment method	Insecticide and formulation	Dilution and rate	Preslaughter interval, restrictions, comments
LICE (NHE 18)				
½ to ⅛ inch long. Biting lice are reddish, flattened, and active. Sucking lice are gray to blue and sluggish. Heavy populations cause poor growth, general unthriftiness, and anemia. Symptoms are rough, patchy hair coats and a dirty appearance. Lice are most troublesome when cattle are crowded in shelters during winter months.	Self-treatment devices such as back rubbers, face rubbers, and dust bags effectively control lice when used in conjunction with systemic insecticides applied from August through October for grub control. The systemics kill lice that are present on animals during the fall; the self-treating devices then hold louse populations below economic levels throughout the winter. Place rubbing devices and dust bags where cattle will use them. For back rubbers and face rubbers, mix insecticides with No. 2 fuel oil, No. 2 diesel fuel, or an oil recommended on the insecticide label. Mineral oil is less irritating than fuel oil. Do not use waste oil or motor oil. Keep dust bags dry. Service self-treating devices at least once per month.			
	Back rubber or face rubber (oilers)	Co-Ral 11.6% EC (coumaphos)	1 gal/13 gal fuel or mineral oil.	0 days. Do not apply with oral drenches, with other internal medications such as phenothiazine, or with natural or synthetic pyrethroids, synergists, or organophosphates.
		malathion 57% EC	0.5 pt/1.5 gal fuel or mineral oil.	0 days.
	Dust bag	Products listed for use in dust bags can also be applied by hand-dusting. Follow label directions.		
		Co-Ral 1% D (coumaphos)	10 lb dust/bag. Use 1 bag/10-20 head.	0 days.
		Rabon 3% D (stirofos)	4-8 lb dust/bag. Use 1 bag/10-20 head.	0 days.

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Beef Cattle and Nonlactating Dairy Cattle, continued

Pest	Treatment method	Insecticide and formulation	Dilution and rate	Preslaughter interval, restrictions, comments
LICE, cont.	Spray	Apply sufficient spray to thoroughly wet each animal. Use up to 1 gallon finished spray per animal. Do not contaminate feed or water.		
	Ciovap 12.5% EC (crotoxyphos plus dichlorvos)		2 gal/100 gal water.	0 days. Make a second application 10-14 days after first. Repeat as necessary but not more often than every 7 days. Do not treat Brahman cattle.
	Co-Ral 11.6% EC or 25% WP (coumaphos)		2 qt 11.6% EC or 2 lb 25% WP/100 gal water.	0 days. Do not treat calves less than 3 months old or sick, convalescent, or stressed cattle. Do not spray within 10 days after shipping, weaning, or disease exposure. Do not spray in nonventilated areas. Do not apply in conjunction with other organophosphates, pyrethrins, synergists, or phenothiazine.
	Ectiban 5.7% EC (permethrin)		1 qt/100 gal water.	0 days. Repeat treatment 14-21 days after first application. Do not treat more often than every 14 days.
	malathion 57% EC		1 gal/100 gal water.	0 days. Do not apply to lactating dairy cattle or within 14 days of freshening. Do not treat calves less than 1 month old.
	Rabon 50% WP or 24% EC (stirofos)		4 lb 50% WP/75 gal water or 1.5 gal 24% EC/100 gal water.	0 days. Beef cattle only.
	Ravap 28.7% EC (stirofos plus dichlorvos)		1 gal/75 gal water.	0 days. Beef cattle only. Do not treat more often than once every 10 days.
Pour-on or spot-on	Fall applications of systemic pour-ons and spot-ons such as Co-Ral (coumaphos), Warbex (famphur), Tiguvon (fenthion), Neguvon (trichlorfon), and Prolate (phosmet) for grub control also reduce louse populations. These treatments may not provide season-long louse control through the winter. Follow label directions concerning reuse after grub treatment cut-off dates. Products listed below do not provide grub control and pose no problems when used after the grub treatment cut-off date.			
	Dursban 44 (chlorpyrifos)		2 cc/100 lb body weight.	14 days. Beef cattle only. Apply as spot treatment. Do not exceed 16 cc/animal. Do not treat calves under 3 months old or bulls over 8 months old. Do not treat purebred continental or exotic breed cattle such as Charolais, Chianina, Simmental, and Gelbvieh. Do not retreat within 30 days. Do not use on cows within 21 days prior to calving or 14 days after calving.
	Lysoff 7.6% EC (fenthion)		1 pt/1 gal water. Use 1 fl oz/100 lb body weight.	21 days; 35 days if 2 applications are made. Do not apply within 28 days of freshening of dairy cattle. Pour evenly along back line. Do not treat calves under 3 months old or sick, convalescent, or stressed livestock. Do not use with other cholinesterase-inhibiting insecticides or drugs.
Injection	Ivomec 1% (ivermectin)		Ready to use. 1 cc/110 lb body weight.	35 days. Inject subcutaneously. Use aseptic procedures. Do not use on dairy cattle of breeding age.

Beef Cattle and Nonlactating Dairy Cattle, continued

Pest	Treatment method	Insecticide and formulation	Dilution and rate	Preslaughter interval, restrictions, comments
CATTLE GRUBS Larvae ("grubs") bore through the skin and migrate within the host to the skin of the back. Grubs ruin hides and reduce weight gain. The hairy, yellow and black adult flies, slightly smaller than honey bees, annoy grazing cattle.		Timing of grub control treatments is important. Systemic insecticides applied as pour-ons, spot-ons, or sprays travel within the animal's bloodstream and should be applied to control grubs 6 to 8 weeks before they migrate to the animal's back. Late treatments may cause host-parasite reactions with symptoms of bloat, hindquarter paralysis, or death. Systemic insecticides should be used on native beef cattle herds in August or September in southern Illinois, and in September or October in the northern half of the state. Treat only pastured cattle in herds with histories of grub problems. Animals in confinement are not attacked by ox warble flies (heel flies). Heel fly season and grub treatment dates are earlier for cattle grazed in southern states. Cattle feeders should either know the origin of feeder cattle to determine grub treatment dates or should purchase only cattle that have received grub treatments.		
				Do not apply systemic insecticides in conjunction with or immediately after phenothiazine, with natural or synthetic pyrethroids or their synergists, or with other organophosphate insecticides. Do not treat cattle under stress from castration, dehorning, weaning, shipping, illness, or overexertion. Do not treat calves less than 3 months old.
	Pour-on		Apply pour-ons using a long-handled dipper supplied by the manufacturer. Apply to the back line from the shoulder to the hip.	
		Co-Ral 4% (coumaphos)	Ready to use. Apply 0.5 fl oz/100 lb body weight.	0 days. Do not apply within 14 days of freshening of dairy cattle.
		Neguvon 8% (trichlorfon)	Ready to use. Apply 0.5 fl oz/100 lb body weight. Do not exceed 4 fl oz/animal.	21 days. Do not apply within 7 days of freshening of dairy cattle.
		Prolate (GX-118) 11.6% E (phosmet)	1 gal/2 gal water. Apply 1 fl oz/100 lb body weight. Do not exceed 8 fl oz/animal.	21 days. Do not apply to dairy animals.
		Tiguvon 3% (fenthion)	Ready to use. Apply 0.5 fl oz/100 lb body weight.	35 days. Do not apply within 28 days of freshening of dairy cattle.
		Warbex 13.2% (famphur)	Ready to use. Apply 0.5 fl oz/100 lb body weight. Do not exceed 4 fl oz/animal.	35 days. Do not apply within 21 days of freshening of dairy cattle. Do not use on Brahmins or Brahman crossbreeds.
	Spot-on	To apply spot-ons, use the applicator system provided by the manufacturer. Apply the material to a single location on the back midline.		
		Spotton 20% (fenthion)	Ready to use. Apply 4 cc/300 lb body weight. Do not exceed 20 cc/animal.	45 days. Do not treat dairy cattle of breeding age.
	Spray	Use high-pressure sprays (250-350 psi) to apply 3 to 4 quarts of finished spray per animal. Because few farm sprayers generate sufficient pressure for proper application, veterinarians and commercial applicators with appropriate livestock spray equipment should be contacted to apply grub sprays. Use a pencil stream of spray directed at right angles to the sides and back. Treat 10 or fewer animals at one time. Do not contaminate feed or water.		
		Co-Ral 25% WP or 11.6% EC (coumaphos)	12-16 lb 25% WP or 8-12 qt 11.6% EC/100 gal water.	0 days. Do not apply within 14 days of freshening of dairy cattle.
		Prolate (GX-118) 11.6% EC (phosmet)	2 gal/100 gal water.	21 days. Beef cattle only.
	Injection	Ivomec 1% (ivermectin)	Ready to use. 1 cc/110 lb body weight.	35 days. Inject subcutaneously. Use aseptic procedures. Do not use on dairy cattle of breeding age.

Beef Cattle and Nonlactating Dairy Cattle, continued

Pest	Treatment method	Insecticide and formulation	Dilution and rate	Preslaughter interval, restrictions, comments
MANGE MITES Microscopic mites live on the skin or burrow into it. Lesions vary with mite species. Infestations are greatest when cattle are crowded in shelters during winter months.		Chorioptic mange is the most prevalent mite-induced disorder of Illinois cattle. Infested cattle may or may not develop lesions; lesions usually occur as localized nodules that exude serum. They are most numerous from the tailhead to the hind heels. Insecticides listed previously for louse control on beef cattle also control chorioptic mange mites. Cattle scabies (psoroptic mange) is a quarantinable disease. Its symptoms are lesions that occur first on the withers, over the back, and at the tailhead. Small wounds cause itching, and rubbing leads to abscesses, especially on the shoulders and rump. Mites move to edges of scabs, causing lesions to enlarge and coalesce. Scabs may cover much of the body. Where cattle scabies is detected, contact the Illinois Department of Agriculture, Bureau of Animal Health, Illinois State Fairgrounds, Springfield, Illinois 62706, 217/782-4944.		
TICKS 8-legged adults of most species are reddish brown and less than $\frac{1}{4}$ inch long. Engorged females may exceed $\frac{1}{2}$ inch in length. Ticks are blood feeders and disease vectors.	Ticks rarely pose an economic threat to cattle in Illinois. Problems are most likely where cattle graze in brushy or wooded areas.			
	Spray	Apply sufficient spray to thoroughly wet each animal; use up to 1 gallon finished spray per animal. Do not contaminate feed or water.		
		Ciovap 12.5% EC (crotoxyphos plus dichlorvos)	2 gal/100 gal water.	0 days. Repeat application 10-14 days after first spray. Do not use more than once every 7 days.
		Co-Ral 25% WP or 11.6% EC (coumaphos)	4 lb 25% WP or 1 gal 11.6% EC/100 gal water.	0 days. Do not treat calves less than 3 months old or sick, convalescent, or stressed cattle. Do not spray within 10 days after shipping, weaning, or disease exposure. Do not spray in nonventilated areas. Do not apply in conjunction with phenothiazine, pyrethroids, synergists, or systemic organophosphate insecticides.
		Ectiban 5.7% EC (permethrin)	1 qt/100 gal water.	0 days. Do not apply more than once every 14 days.
		malathion 57% EC	1-2 gal/100 gal water.	0 days. Do not apply to dairy cattle within 14 days of freshening. Do not treat calves less than 1 month old.
MOSQUITOES Annoyance may cause cattle to bunch in or near buildings and reduce their grazing.	Mosquito populations are greatest near low, wet areas, ponds, or slow-moving streams. Reduction of mosquito breeding sites is necessary for long-term control.			
	Spray (to animals)	Vapona 23.4% EC (dichlorvos)	1 qt/6 gal water. Mist 1-2 fl oz/animal/day.	1 day. Do not contaminate feed or water. Do not wet skin. Do not apply in conjunction with trichlorfon.
		pyrethrin (0.1%) plus synergist	Mist 1-2 fl oz/animal.	0 days. Do not contaminate feed or water. Do not wet skin. Repeat as necessary.
HORSE FLIES, DEER FLIES (NHE 60) Large flies that feed on the back, shoulders, neck, and head. Blood feeding annoys cattle and reduces grazing and weight gain. Wounds attract other flies.	Adequate and practical control methods for horse flies and deer flies on pastured beef cattle are not available. Pyrethrin applications provide some relief but must be repeated frequently. Place cattle in barns or sheds to protect them from horse flies and deer flies.			
	Spray	pyrethrin (0.5-1.0%) plus synergist	0.5% oil is ready to use; apply 2 fl oz/animal 3 times per week. Mix 1 gal 1% EC/10 gal water; apply 1 to 2 pt/animal every 3 days.	0 days. Apply to head, back, sides, belly, and legs. Do not contaminate feed or water.

Beef Cattle and Nonlactating Dairy Cattle, continued

Pest	Treatment method	Insecticide and formulation	Dilution and rate	Preslaughter interval, restrictions, comments
PASTURE FLIES (HORN FLIES, FACE FLIES, STABLE FLIES)		Moving cattle into barns or sheds will reduce attacks by horn flies and face flies. Estimated treatment thresholds are 15 face flies, 50 horn flies, or 4 stable flies per animal.		
Horn flies (NHE 59) are smaller than house flies but are similarly colored and marked. They have piercing mouthparts and are blood feeders. Horn flies congregate about the back, shoulders, and horns; on hot days they are mostly on the shady side of the animal or on the belly. Horn flies seldom follow animals into barns or sheds.	Back rubber or face rubber (oilers)	Mix insecticides with No. 2 fuel oil, No. 2 diesel fuel, or a label-recommended mineral oil. Mineral oils are less irritating than fuel oils. Do not use waste oil or motor oil. Service the rubbing device at least once per week. Self-treating devices are effective only if they are used regularly. Place rubbing devices in the entryways to water or mineral feeders to ensure usage. Effective horn fly control can be achieved with forced-use oilers, but only partial control of face flies is provided by these devices. Oilers do not control stable flies.		
		Ciovap 12.5% EC (crotoxyphos plus dichlorvos)	1 qt/4 gal fuel or mineral oil.	0 days.
		Co-Ral 11.6% EC (coumaphos)	1 gal/13 gal fuel or mineral oil.	0 days.
		Ectiban 5.7% EC (permethrin)	1 qt/10 gal diesel oil.	0 days.
		Ravap 28.7% EC (stirofos plus dichlorvos)	1 qt/7 gal fuel or mineral oil.	0 days. Beef cattle only.
	Dust bag	Dust bags are effective only if they are used regularly. Place them in the entryways to water or mineral feeders to ensure use. Keep dust bags dry and well charged; service at least once per week. Forced-use dust bags that contact the animal's face provide effective horn fly control and significant reductions in face flies; dust bags do not effectively control stable flies.		
		Ciodrin 3% D (crotoxyphos)	4-8 lb/bag.	0 days. Do not treat calves less than 6 months old. Do not treat Brahman cattle.
		Co-Ral 1% D (coumaphos)	10 lb/bag.	0 days.
		Ectiban 0.25% D (permethrin)	10 lb/bag.	0 days.
		Rabon 3% D (stirofos)	4-8 lb/bag.	0 days.
Face flies (NHE 106) resemble house flies but are slightly larger and darker. Only females frequently visit cattle. They feed on secretions about the eyes, nose, and mouth. Annoyance to cattle reduces feeding. Face flies also transmit pinkeye. Face flies do not attack cattle in barns or sheds.	Feed additive	Feed additives prevent the development of face fly and horn fly larvae in cattle manure. Stable flies do not develop in fresh manure and are not controlled by feed additives. Face flies migrate considerable distances, so larval control in manure of a single herd will not significantly reduce fly populations if other herds in the area do not also receive feed additives. Animals must consume the recommended dosage for the feed additive to be effective.		
		Altosid 0.02% (methoprene)	0.25-0.5 lb/100 lb body weight/animal/month.	0 days. Feed mineral mix or block from May to September.
		phenothiazine 17.8%	Mix 1:3 with salt. Use 1 lb mixture/10 head/day.	0 days. Feed no other salt. Use from May to September.
		Rabon 97.3% or 7.76% Oral Larvicide (stirofos)	70 mg a.i./100 lb body weight/day.	0 days. Use from May through September. Mix with complete feeds, concentrates, or protein supplements.
Stable flies (NHE 61) resemble house flies but have a bayonetlike proboscis that protrudes from the front of the head. Stable flies are blood feeders that often attack the lower portion of the front legs. Stable flies attack both pastured and feedlot cattle	Ear tag or ear tape	Ear tags impregnated with fenvalerate, flucythrinate, or permethrin and permethrin-impregnated ear tapes effectively control horn flies and provide significant reductions in face flies. They do not control stable flies.		
		fenvalerate 8% tag (Ectrin, Insecta-Shield, Ear Tag Plus, Starbar, Vet Shack)	2 tags per head.	0 days. Apply when fly activity begins in spring; remove in fall or before slaughter.

Beef Cattle and Nonlactating Dairy Cattle, continued

Pest	Treatment method	Insecticide and formulation	Dilution and rate	Preslaughter interval, restrictions, comments
PASTURE FLIES, cont.	Ear tag or ear tape, cont.	flucythrinate 7.5% tag (Guardian)	2 tags per head.	0 days. Apply when fly activity begins in spring; remove in fall or before slaughter.
		permethrin 10% tag (Atroban, Insecta- Gard, Gard Star, Fearing Du-flex, Gen-Sal, Permethrin)	2 tags per head.	0 days. Apply when fly activity begins in spring; remove in fall or before slaughter.
		permethrin 0.9 g tape (Ectiban)	1 tape per animal.	0 days. Apply when fly activity begins in spring; remove in fall or before slaughter.
Spray	Sprays directed to animals should not contaminate feed or water.			
		Ciovap 12.5% EC (crotoxyphos plus dichlorvos)	1 pint/1.5 gal water. Use 1-2 fl oz mist/animal/day. <i>OR:</i> 2 gal/50 gal water. Use 1-2 qt/animal.	0 days. 0 days. Repeat as needed, but not more often than once every 7 days.
		Co-Ral 11.6% EC or 25% WP (coumaphos)	2 qt 11.6% EC or 2 lb 25% WP/ 100 gal water. Completely wet skin to runoff.	0 days. Do not apply to dairy cattle within 14 days of freshening.
		Ectiban 5.7% EC (permethrin)	1 qt/100 gal water. Thoroughly wet animals.	0 days. Repeat as needed, but not more often than once every 14 days.
		Ectrin 10% WDL (fenvalerate)	8 oz/2½ gal water. Mist 2-3 fl oz/animal every 4-7 days. Or mix 8 oz/12 gal water. Use 1 qt/ animal every 7 days.	0 days. State-labeled use; applicator must have label in possession.
		Rabon 50% WP (stirofos)	4 lb/75 gal water. Use ½ to 1 gal/animal.	0 days. Beef cattle only.
		Ravap 28.7% EC (stirofos plus dichlorvos)	1 gal/75 gal water. Use ½ to 1 gal/animal.	0 days. Beef cattle only. Repeat as needed, but not more often than once every 10 days.

Beef Cattle and Nonlactating Dairy Cattle, continued

Pest	Treatment method	Insecticide and formulation	Dilution and rate	Preslaughter interval, restrictions, comments
FLIES IN BEEF CATTLE BUILDINGS AND PREMISES (HOUSE FLIES, STABLE FLIES)		Sanitation is essential for successful fly control in buildings and premises. Thorough sanitation includes weekly removal of manure and decaying hay, straw, and wasted feed, especially from beneath feed bunks and along fences. When manure is piled, cover with black plastic to prevent stable fly development. If intervals between manure removals are greater than 1 week, leave an 8-inch manure residue to enhance biological control.		
House flies (NHE 16) develop in any moist, decaying organic matter. They annoy cattle and transmit several diseases of animals and humans.	Mist blower or fogger	Dibrom 1% (naled)	1 fl oz/3,000 cu ft.	0 days. Use in livestock buildings and pens. Can be applied when animals are present, but do not apply directly to livestock. Avoid contamination of feed and water.
		Ectiban 5.7% EC (permethrin)	<i>Misting:</i> Use 4 fl oz/1,000 sq ft. <i>Overhead system:</i> 1 qt/12.5 gal diesel or mineral oil; use 4 fl oz/1,000 cu ft.	0 days. Do not apply directly to livestock. Do not treat manure or litter. Do not contaminate feed or water. Repeat as needed, but not more often than every 14 days.
Stable flies (NHE 61) resemble house flies but bear bayonetlike mouth-parts. Stable flies are blood feeders that usually attack lower portions of the front legs. Stable flies attack both pastured and feedlot cattle.		Vapona 23.4% EC (dichlorvos)	<i>Misting:</i> 1 pint/6 gal water; use 1 qt/8,000 cu ft. <i>Fogging:</i> 1 pint/3.5 gal diesel oil. Use 1 pint/8,000 cu ft.	0 days. Use in livestock buildings and reduce air movement during application. Avoid contamination of feed and water.
		Vapona Feedlot 43.2% EC (dichlorvos)	1 gal/100 gal water. Use 5 gal/acre.	0 days. Use in outdoor facilities. Animals may be present during application. Avoid contamination of feed and water.
	Residual wall spray	Baytex 45% EC (fenthion)	3 qt/25 gal water. Use 1 gal/500 sq ft.	0 days. Avoid contaminating feed and water. Remove animals before spraying. Keep them out for at least 4 hours. Provides control for 2-5 weeks.
		Cygon 23.4% EC (dimethoate)	1 gal/25 gal water. Use 1-2 gal/1,000 sq ft.	0 days. Avoid contaminating feed and water. Remove animals before spraying. Keep them out for at least 4 hours. Provides control for 2-4 weeks.
		diazinon 50% WP	2 lb/25 gal water. Use 1-2 gal/1,000 sq ft.	0 days. Avoid contaminating feed and water. Remove animals before spraying. Keep them out for at least 4 hours. Provides control for 2-4 weeks.
		Ectiban 25% WP or 5.7% EC (permethrin); Atroban, Insectrin, Overtime, and Permethrin are additional permethrin formulations with state labels for use as residual wall sprays.	6 oz 25% WP/11 gal water or 1 qt 5.7% EC/12.5 gal water. Use 1 gal/750 sq ft. Or use 4 fl oz 5.7% EC (undiluted)/1,000 sq ft with a mist blower.	0 days. Do not treat manure or apply directly to livestock. Avoid contaminating feed and water. Provides control for 3-7 weeks.
		Rabon 50% WP (stirofos)	4-8 lb/25 gal water. Use 1 gal/500-1,000 sq ft.	0 days. Avoid contaminating feed and water. Remove animals before spraying and keep them out for at least 4 hours. Provides control for 2-4 weeks.
		Ravap 28.7% EC (stirofos plus dichlorvos)	1 gal/25 gal water. Use 1 gal/500-1,000 sq ft.	0 days. Avoid contamination of feed and water. Remove animals before spraying and keep them out for at least 4 hours. Provides control for 2-4 weeks.

Beef Cattle and Nonlactating Dairy Cattle, continued

Pest	Treatment method	Insecticide and formulation	Dilution and rate	Preslaughter interval, restrictions, comments
FLIES IN BEEF CATTLE BUILDINGS AND PREMISES, cont.	Feed additive	Feed additives (listed in conjunction with pasture fly control) used to prevent the development of fly larvae in feces provide minimal control of flies in livestock buildings. Feed additives do not reach house fly and stable fly larvae that develop in sites other than fresh manure. Good sanitation more effectively prohibits larval development.		
	Manure drench	Manure drenches control fly larvae that are developing in treated feces. Migration of adult flies from nearby areas can occur if any breeding sites remain untreated. Manure drenches are recommended only where manure cannot be removed on a weekly basis. Apply drenches at rates that wet the manure surface; soaking is not necessary. Repeat applications as necessary, but not more often than every 7 days. Do not apply where mammals or birds will come in contact with the manure. Do not apply treated manure to crops not listed on the insecticide label.		
		Cygon 23.4% EC (dimethoate)	0.5 pt/5 qt water. Apply as a coarse spray.	0 days.
		Rabon 50% WP or 24% EC (stirofos)	4 lb 50% WP or 1 gal 24% EC/25 gal water. Use 1 gal/100 sq ft manure.	0 days.
		Ravap 28.7% EC (stirofos plus dichlorvos)	1 gal/25 gal water. Use 1 gal/100 sq ft manure.	0 days.
		Vapona 23.4% EC (dichlorvos)	1 gal/25 gal water. Use 1-2 qt/100 sq ft manure.	0 days.

Lactating Dairy Cattle

Insecticides listed in this section are registered for use on lactating dairy cattle. Most insecticides listed for use on beef cattle can be applied to nonlactating dairy cattle if the specified interval between application and freshening is observed. Follow all label directions.

Pest	Treatment method	Insecticide and formulation	Dilution and rate	Preslaughter interval, restrictions, comments
LICE (NHE 18) ½ ₁₆ to ½ inch long. Biting lice are reddish, flattened, and active. Sucking lice are gray to blue and sluggish. Heavy populations cause reduced milk production and anemia. Symptoms are rough, patchy hair coats and a dirty appearance. Most troublesome in winter.	Dust bag	Place dust bags at milkroom exits. Keep bags changed and dry, and service at least once per month. (Both Co-Ral 1% dust and Ciordin 3% dust can be used for direct hand-dusting; follow label directions.)		
		Co-Ral 1% D (coumaphos)	10 lb dust/bag.	0 days.
		Ciordin 3% D (crotoxyphos)	4-8 lb dust/bag.	0 days. Do not treat calves less than 6 months old.
	Spray	Apply sufficient spray to thoroughly wet each animal; use up to 1 gallon finished spray per animal. Do not contaminate feed, water, milk, or milking equipment.		
		Ciovap 12.5% EC (crotoxyphos plus dichlorvos)	1 qt/12 gal water.	0 days. Make a second application 10-14 days after first. Repeat as needed, but not more than once every 7 days.
		Co-Ral 11.6% EC or 25% WP (coumaphos)	1 qt 11.6% EC or 1 lb 25% WP/100 gal water.	0 days. Do not treat calves less than 3 months old.
		Ectiban 5.7% EC (permethrin)	1 qt/100 gal water.	0 days. Repeat application 14-21 days after first treatment.

Lactating Dairy Cattle, continued

Pest	Treatment method	Insecticide and formulation	Dilution and rate	Preslaughter interval, restrictions, comments
CATTLE GRUBS	No pesticides are currently registered for control of cattle grubs on lactating dairy cattle.			
MANGE MITES	Mange caused by chorioptic mites (barn itch mites) is the most common mite-induced disorder of Illinois dairy cattle. Infested cattle may or may not develop lesions; lesions usually appear as localized nodules that exude serum. Lesions are most prevalent from the tailhead to the hind heels. Insecticides listed for louse control on dairy cattle also control chorioptic mange. Cattle scabies (psoroptic mange) is a quarantinable disease. Its symptoms are lesions that occur first at the withers, over the back, and at the tailhead. The wounds itch, and rubbing leads to abscesses, especially on the shoulders and rump. Mites move to edges of scabs, causing lesions to enlarge and coalesce. Scabs may cover much of the body. Where cattle scabies is detected, contact the Illinois Department of Agriculture, Bureau of Animal Health, Illinois State Fairgrounds, Springfield, Illinois 62706, 217/782-4944.			
TICKS	Ticks are rarely economically important on Illinois dairy cattle. Problems are most likely where cattle graze in brushy or wooded areas.			
8-legged adults of most species are reddish brown and less than $\frac{1}{4}$ inch long. Engorged females may exceed $\frac{1}{2}$ inch in length. Ticks are blood feeders and disease vectors.	Spray	Ciovap 12.5% EC (crotoxyphos plus dichlorvos)	1 qt/12 gal water. Use up to 1 gal/animal.	0 days. Make a second application 10-14 days after first. Do not apply more often than once every 7 days.
		Ciodrin 14.4% EC (crotoxyphos)	1 qt/12 gal water. Use up to 1 gal/animal.	0 days. Make a second application 10-14 days after first. Do not apply more often than once every 7 days.
		Ectiban 5.7% EC (permethrin)	1 qt/25 gal water. Use 1-2 qt/animal.	0 days. Do not apply more often than once every 14 days.
MOSQUITOES	Mosquito populations are greatest near low, wet areas, ponds, and slow-moving streams. Reduction of mosquito breeding sites is necessary for long-term control.			
Blood feeding. Annoyance may cause cattle to remain in buildings and reduce their grazing.	Spray (to animals)	Vapona 23.4% EC (dichlorvos)	1 qt/6 gal water. Mist 1-2 fl oz/animal/day.	1 day. Do not wet skin. Do not contaminate feed, water, milk, or milking equipment.
		pyrethrin (0.03-0.10%) plus synergist (0.5-1.0%)	Ready to use. Mist 1-2 fl oz/animal.	0 days. Do not wet skin. Do not contaminate feed, water, milk, or milking equipment. Repeat as necessary.
PASTURE FLIES (HORN FLIES, FACE FLIES, STABLE FLIES)	Reduce attacks by horn flies, face flies, deer flies, and horse flies by moving cattle into barns or sheds.			
Horn flies (NHE 59) are smaller than house flies but are similarly colored and marked. They have piercing mouthparts and are blood feeders. Horn flies congregate about the back, shoulders, and horns; on hot days they are mostly on the shady side of the animal or on the belly. Horn flies seldom follow animals into barns or sheds.	Back rubber or face rubber (oilers)	Mix insecticides with No. 2 fuel oil, No. 2 diesel fuel, or a label-recommended mineral oil. Mineral oils are less irritating than fuel oils. Do not use waste oil or motor oil. Service the oiler at least once per week. For self-treating devices to be effective, cattle must use them frequently. Place oilers in the entryways to water or mineral feeders or in the milking room exit. Well-used back rubbers or face rubbers will control horn flies and provide some face fly control. They will not control stable flies.		
		Ciodrin 14.4% EC (crotoxyphos)	1 gal/16 gal fuel or mineral oil.	0 days.
		Ciovap 12.5% EC (crotoxyphos plus dichlorvos)	1 gal/16 gal fuel or mineral oil.	0 days.
		Co-Ral 11.6% EC (coumaphos)	1 gal/13 gal fuel or mineral oil.	0 days.
		Ectiban 5.7% EC (permethrin)	1 qt/10 gal oil.	0 days.

Lactating Dairy Cattle, continued

Pest	Treatment method	Insecticide and formulation	Dilution and rate	Preslaughter interval, restrictions, comments
PASTURE FLIES, cont.	Dust bag	For self-treating devices to be effective, cattle must use them regularly. Place dust bags in the entryways to water or mineral feeders or in the milking room exit. Keep dust bags dry; service at least once per week. Dust bags will control horn flies and provide some reduction in face fly problems. They will not control stable flies. (NOTE: Insecticide dusts listed below can also be used for direct hand-dusting; follow label directions.)		
Face flies (NHE 106) resemble house flies but are slightly larger and darker. Only females frequently visit cattle. They feed on secretions about the eyes, nose, and mouth. Annoyance to cattle reduces feeding. Face flies also transmit pinkeye. Face flies do not attack cattle in barns or sheds.		Ciodyn 3% D (crotoxyphos)	4-8 lb/dust bag.	0 days. Do not treat calves less than 6 months old.
		Co-Ral 1% D (coumaphos)	10 lb/dust bag.	0 days. Do not treat calves less than 3 months old.
		Ectiban 0.25% D (permethrin)	10 lb/dust bag.	0 days.
		Rabon 3% D (stirofos)	4-8 lb/dust bag.	0 days.
Stable flies (NHE 61) resemble house flies but have a bayonetlike proboscis that protrudes from the front of the head. Stable flies are blood feeders that often attack the lower portion of the front legs. Stable flies attack both pastured and feedlot cattle.	Spray	It is important that the following sprays do not contaminate feed, water, milk, or milking equipment.		
		Ciovap 12.5% EC (crotoxyphos plus dichlorvos)	1 qt/3 gal water. Mist 1-2 fl oz/animal/day.	0 days.
		Ectiban 5.7% EC (permethrin)	1 qt/25 gal water. Use 1-2 qt/animal.	0 days. Retreat as needed, but not more often than every 14 days.
		Ectrin 10% WDL (fenvalerate)	8 oz/2½ gal water; mist 2-3 oz/animal every 4-7 days. OR: 8 oz/12 gal water; use 1 qt/animal every 7 days.	0 days. State-labeled use; applicator must have label in possession.
		Vapona 23.4% EC or 1% EC oil base (dichlorvos)	1 qt 23.4%/6 gal water; use 1-2 fl oz/animal/day. OR: 1% EC (oil base), ready to use; mist 1-2 fl oz/animal/day.	0 days. Do not wet skin.
		pyrethrin (0.1%) plus synergist	Ready to use. Apply 1-2 fl oz/animal.	0 days. Repeat as needed.
Feed additive	Animals must consume the recommended dosage for the feed additive to be effective. A feed additive reduces fly development only in treated manure; it does not control existing adult flies. Increase control by practicing good sanitation; remove nearby manure, silage, feed, and other fly-breeding materials.	Rabon 97.3% or 7.76% Oral Larvicide (stirofos)	70 mg a.i./100 lb body weight/day.	0 days. Feed in complete feeds, concentrates, or protein and mineral supplements from May to September.

Lactating Dairy Cattle, continued

Pest	Treatment method	Insecticide and formulation	Dilution and rate	Preslaughter interval, restrictions, comments
PASTURE FLIES, cont.	Ear tag or ear tape	Ear tags and ear tapes effectively control horn flies and reduce face fly problems. They do not control stable flies. fenvalerate 8% ear tag (Ectrin, Insecta-Shield, Ear Tag Plus, Starbar, Vet Shack)	2 tags per head.	0 days. Apply tags when flies first appear in the spring. Remove in fall or before slaughter.
		flucythrinate 7.5% tag (Guardian)	2 tags per head.	0 days. Apply when fly activity begins in spring; remove in fall or before slaughter.
		permethrin 10% ear tag (Atroban, Insecta-Gard, Gard Star, Fearing, Permethrin, Wellcome Tag)	2 tags per head.	0 days. Apply tags when flies first appear in spring. Remove in fall or before slaughter.
		permethrin 0.9 g ear tape (Ectiban)	1 tape per animal.	0 days. Apply tape when flies first emerge in spring. Remove in fall or before slaughter.
FLY CONTROL IN DAIRY BUILDINGS AND PREMISES OTHER THAN MILKING ROOMS (HOUSE FLIES, STABLE FLIES)		Sanitation is essential for effective fly control in and around dairy buildings. In addition to removing manure weekly, regularly clean calf pens and remove spilled hay, green chop, and silage. Cover manure piles with black plastic to prevent stable fly breeding. If manure is not removed weekly, leave an 8-inch manure residue at each cleanup; this residue maintains biological control agents.		
House flies (NHE 16) develop in any moist, decaying organic matter. They annoy cattle and transmit several diseases of animals and humans.	Mist blower or fogger	Space sprays listed below should not be applied directly to livestock or manure.		
		Dibrom 1% (naled)	1 fl oz/3,000 cu ft.	0 days. Avoid contamination of feed and water.
		Ectiban 5.7% EC (permethrin)	<i>Misting:</i> Use 4 fl oz/1,000 sq ft. <i>Overhead system:</i> 1 qt/12.5 gal diesel oil or mineral oil; use 4 fl oz/1,000 cu ft.	0 days. Do not contaminate feed or water. Do not apply more than once every 14 days.
		Vapona 23.4% EC (dichlorvos)	<i>Misting:</i> 1 pt/6 gal water; use 1 qt/8,000 cu ft. <i>Fogging:</i> 1 pt/3.5 gal diesel oil; use 1 pt/8,000 cu ft.	0 days. For use in dairy barns. Close doors and windows to reduce air movement during application. Avoid contamination of feed and water.
		Vapona Feedlot 43.2% EC (dichlorvos)	1 gal/100 gal water. Apply over dairy lot at 5 gal spray/acre.	0 days. Animals may be present during treatment. Avoid contamination of feed and water.
		pyrethrin (0.1%) plus synergist	Apply as directed on container.	0 days. Use as space spray for quick knock-down.
	Residual wall spray	Residual treatments listed below are not to be applied in milking rooms unless otherwise noted. Do not apply directly to livestock or manure. Do not contaminate feed, water, milk, or milking equipment.		
		Baytex 45% EC (fenthion)	3 qt/25 gal water. Use 1 gal/500 sq ft.	0 days. Remove all animals before spraying. Keep them out of treated buildings for at least 4 hours. Provides control for 2-5 weeks.
		Cygon 23.4% EC (dimethoate)	1 gal/25 gal water. Use 1-2 gal/1,000 sq ft.	0 days. Remove all animals before spraying. Keep them out of treated buildings for at least 4 hours. Provides control for 2-4 weeks.

Lactating Dairy Cattle, continued

Pest	Treatment method	Insecticide and formulation	Dilution and rate	Preslaughter interval, restrictions, comments
FLY CONTROL IN DAIRY BUILDINGS, cont.	Residual wall spray, cont.	Ectiban 25% WP or 5.7% EC (permethrin); Atroban, Insectrin, Overtime, and Permectrin are additional permethrin formulations with state labels for use as residual wall sprays.	6 oz 25% WP/11 gal water or 1 qt 5.7% EC/12.5 gal water. Apply 1 gal/750 sq ft. Or use 4 fl oz 5.7% EC (undiluted)/1,000 sq ft with a mist sprayer.	0 days. Retreat as needed, but not more than once every 14 days. Provides control for 3-7 weeks.
		Rabon 50% WP (stirofos)	4-8 lb/25 gal water. Use 1-2 gal/1,000 sq ft.	0 days. Remove all animals before spraying. Keep them out of treated buildings for at least 4 hours. Provides control for 2-4 weeks.
		Ravap 28.7% EC (stirofos plus dichlorvos)	1 gal/25 gal water. Use 1-2 gal/1,000 sq ft.	0 days. Remove all animals before spraying. Keep them out of treated buildings for at least 4 hours. Provides control for 2-4 weeks.
Feed additive	Animals must consume the recommended dosage for the feed additive to be effective. A feed additive reduces fly development only in treated manure; it does not control existing adult flies. Increase control by practicing good sanitation; remove nearby manure, silage, feed, and other fly-breeding materials.	Rabon 97.3% or 7.76% Oral Larvicide (stirofos)	70 mg a.i./100 lb body weight/day.	0 days. Feed in complete feeds, concentrates, or protein and mineral supplements from May to September.
Bait	Dipterex 1% Dry (trichlorfon)	Use 4 oz/1,000 sq ft.	0 days. Place in areas where flies congregate, but not where animals can contact bait. Do not contaminate food, water, milk, or milking equipment.	
	Vapona 0.5% Dry (dichlorvos)	Use 0.25 lb/1,000 sq ft.	0 days. Place in areas where flies congregate, but not where animals can contact bait. Do not contaminate food, water, milk, or milking equipment.	
Fly strip	Vapona Strips (dichlorvos)	Suspend 1 strip/1,000 cu ft.	0 days. Dichlorvos strips can be used in milkrooms. Some milk associations may recommend against their use. Keep doors and windows closed to retain vapors. Do not hang near light bulbs or within reach of animals.	
CONTROL OF FLIES IN MILKING ROOMS	Although effective fly control is essential in dairy barns and milkrooms, small amounts of pesticides can be detected in milk, and their presence is often illegal. To control flies and avoid residue problems, the following steps are recommended:			
	<ol style="list-style-type: none"> 1. Use good sanitation and recommended insecticides in dairy barns to reduce the number of flies entering the milkroom. 2. Use sticky fly strips where appropriate. 3. Use tight screens (14-16 mesh) on milkroom doors and windows. Copper, aluminum, bronze, plastic, or rust-resisting screens are best. 4. Dichlorvos resin strips will give excellent control if windows and doors are kept closed when one strip per 1,000 cubic feet of space is used. Replace strips when they become ineffective. 5. Use a mist or aerosol spray of 0.06-0.1% pyrethrins plus piperonyl butoxide oil-base fly sprays in the milkroom when resin strips do not give adequate fly control. To prevent milk contamination, cover all milking utensils, cans, bulk tanks, and containers before spraying. 			

Hogs

Pest	Treatment method	Material and formulation	Dilution and rate	Preslaughter interval, restrictions, comments
MANGE MITES (AND LICE) Microscopic mites feed on or within skin and cause mange. Sarcoptic mange usually starts at the head and then spreads back; infested skin becomes dry, scurfy, or leathery. Rubbing may lead to raw or scabby areas. Demodectic mange is characterized by hard, round swellings on or below the skin surface.		Sarcoptic mange can be controlled effectively with the insecticides listed below. Although these insecticides will aid in controlling demodectic mange, there is no satisfactory chemical control for the hog follicle mites that cause demodectic mange. Prevent sarcoptic mange outbreaks by treating pigs as soon as possible after weaning; treat sows 30-45 days before farrowing; treat boars before the breeding season. Follow label precautions against the use of organophosphate sprays, dusts, or pour-ons simultaneously with medications used for internal parasite control. Do not contaminate feed or water. Isolate hogs with demodectic mange. Kill and destroy severely infested animals; market for slaughter the animals that are less severely attacked. Clean and disinfect pens, sheds, etc., before moving in uninfested animals.		
	Spray	Ectiban 5.7% EC (permethrin)	1 qt/25 gal water. Spray animals thoroughly.	5 days. Repeat application after 14 days.
		lindane 12.4% EC or 20% EC	3 pt 12.4% EC or 1 qt 20% EC/100 gal water. Spray animals thoroughly.	30 days. Treat twice at a 7-day interval. Do not treat pigs less than 3 months old. Do not treat sows within 2 weeks before farrowing or 3 weeks after farrowing.
		malathion 57% EC	1 qt/15 gal water. Treat animals, bedding, and walls thoroughly.	0 days. Do not treat pigs less than 1 month old. Repeat treatment after 10 days.
	Dust	malathion 4-5% D	Thoroughly cover animals over 1 month old. Also treat pens and bedding. Use $\frac{1}{4}$ - $\frac{1}{2}$ tbsp/pig for pigs less than 1 month old.	0 days. Repeat as needed. Gives only partial control of mange mites.
LICE Up to $\frac{1}{6}$ inch long. Hog lice suck blood and cause irritation and itching of skin. Animals may rub infested areas and cause bleeding. Infested animals appear generally unthrifty.		Insecticides listed for controlling mange mites on hogs will also control lice. Do not contaminate feed or water. Follow label precautions against the use of organophosphate sprays, dusts, or pour-ons simultaneously with medications used for internal parasite control.		
	Spray	Ciodyn 14.4% EC (crotoxyphos)	1 qt/12 gal water. Spray each animal thoroughly.	0 days. Apply a second spray 10-14 days after first. Do not treat more often than every 7 days.
		Co-Ral 25% WP (coumaphos)	2 lb/100 gal water. Spray each animal thoroughly.	0 days. Do not treat animals less than 90 days old. Apply a second spray 10-14 days after first.
		methoxychlor 50% WP	8 lb/100 gal water. Spray each animal thoroughly.	0 days. Make second application 14 days after first if needed.
	Dust	Co-Ral 1% D (coumaphos)	1 oz/animal.	0 days. Dust especially around shoulders and back. Repeat as needed, but not more than once every 10 days.
		Ectiban 0.25% D (permethrin)	1 oz/animal.	5 days. Make second application 14 days after first.
		Rabon 3% D (stirofos)	3-4 oz/animal; 1 lb/150 sq ft of bedding for severe infestations.	0 days. Do not retreat for 14 days.
	Pour-on	Tiguvon 3% Pour-On (fenthion)	0.5 fl oz/100 lb body weight.	14 days. May be used on gestating and lactating sows. Do not retreat within 35 days.

Hogs, continued

Pest	Treatment method	Insecticide and formulation	Dilution and rate	Preslaughter interval, restrictions, comments
HOUSE FLIES, STABLE FLIES		Remove bedding, manure, and wastes from inside and around buildings every 5-7 days. Spread wastes thinly on pastures or store wet in pits or lagoons. Good sanitation practices reduce fly breeding and increase the success of chemical control efforts.		
House flies (NHE 16) are a general annoyance to swine and other animals.	Mist blower or fogger	Dibrom 1% (naled)	1 fl oz/3,000 cu ft. Daily use is necessary when used alone.	0 days. Do not apply directly to livestock. Reduce air movement. Avoid contamination of feed and water.
Stable flies (NHE 16) have piercing mouthparts used for blood sucking. They can significantly reduce animal performance.		Ectiban 5.7% EC (permethrin)	<i>Misting:</i> Use 4 fl oz/1,000 sq ft. <i>Overhead system:</i> 1 qt/12.5 gal diesel or mineral oil; use 4 fl oz/1,000 cu ft.	0 days. Do not treat manure or litter. Retreat as needed but not more than once every 2 weeks. 0 days. Nozzles should be directed away from livestock.
House flies and stable flies develop in moist, decaying organic matter.		Vapona 23.4% EC (dichlorvos)	<i>Misting:</i> 1 pt/6 gal water; use 1 qt/8,000 cu ft. <i>Fogging:</i> 1 pt/3.5 gal diesel oil. Use 1 pt/8,000 cu ft.	0 days. Do not apply directly to animals. Reduce air movement as much as possible. Avoid contamination of feed and water.
		pyrethrin (0.1%) plus synergist	Apply as directed on container.	0 days. Space spray for quick knockdown.
Residual wall spray	Ciovap 12.5% EC (crotoxyphos plus dichlorvos)	2 gal/25 gal water. Use 1-2 gal/1,000 sq ft.	0 days. Spray at least twice monthly. Do not apply directly to livestock. Avoid contamination of feed and water.	
	Cygon 23.4% EC (dimethoate)	1 gal/25 gal water. Use 1-2 gal/1,000 sq ft.	0 days. Remove all animals before spraying buildings. Do not apply directly to livestock. Avoid contamination of feed and water.	
	Ectiban 25% WP or 5.7% EC (permethrin); Atroban, Insectrin, Overtime, and Permethrin are additional permethrin formulations with state labels for use as residual wall sprays.	6 oz 25% WP/11 gal water or 1 qt 5.7% EC/12.5 gal water. Use 1 gal/750 sq ft. Or direct 4 fl oz 5.7% EC (undiluted)/1,000 sq ft with a mist sprayer.	0 days. Do not apply directly to livestock. Avoid contamination of feed and water. Do not treat manure. Retreat as needed, but not more than once every 2 weeks.	
	Rabon 50% WP (stirofos)	4-8 lb/25 gal water. Use 1 gal/500-1,000 sq ft.	0 days. Do not apply directly to livestock. Avoid contamination of feed and water.	
	Ravap 28.7% EC (stirofos plus dichlorvos)	1 gal/25 gal water. Use 1 gal/500-1,000 sq ft.	0 days. Do not apply directly to livestock. Avoid contamination of feed and water.	
Bait	Dipterex 1% Dry (trichlorfon)	4 oz/1,000 sq ft.	0 days. Place in areas where flies congregate during the day. Do not place in areas where animals can come in contact with bait or where bait can contaminate water.	
	Vapona 0.5% Dry (dichlorvos)	0.25 lb/1,000 sq ft.	0 days. Place in areas where flies congregate during the day. Do not place in areas where animals can come in contact with bait or where bait can contaminate water.	
Fly strip	Vapona Strips (dichlorvos)	Suspend 1 strip/1,000 cu ft.	0 days. Doors and windows must be closed so that vapors can build up to recommended levels. Do not hang near light bulbs or within reach of animals.	

Hogs, continued

Pest	Treatment method	Insecticide and formulation	Dilution and rate	Preslaughter interval, restrictions, comments
HOUSE FLIES, STABLE FLIES, cont.	Manure drench	Use manure drenches to kill fly larvae that are developing in animal feces. Do not treat more than once every 7-10 days or apply where mammals or birds will contact treated manure. Do not apply treated manure to crops not listed on the insecticide label.		
		Cygon 23.4% EC (dimethoate)	0.5 pt/5 qt water. Apply as a coarse spray.	0 days.
		Rabon 50% WP or 24% EC (stirofos)	4 lb 50% WP or 1 gal 24% EC/25 gal water. Use 1 gal/100 sq ft manure.	0 days.
		Ravap 28.7% EC (stirofos plus dichlorvos)	1 gal/25 gal water. Apply 1 gal/100 sq ft manure.	0 days.
		Vapona 23.4% EC (dichlorvos)	1 gal/25 gal water. Apply 1-2 qt/100 sq ft manure.	0 days.

Sheep

Pest	Treatment method	Material and formulation	Dilution and rate	Preslaughter interval, restrictions, comments
KEDS, LICE (NHE 53)	Spray	Apply enough spray to thoroughly cover each animal. Do not contaminate feed or water.		
Sheep keds (also called sheep ticks) are flattened, wingless, reddish brown flies about the size of house flies.		Ciovap 12.5% EC (crotoxyphos plus dichlorvos)	2 gal/100 gal water. Use up to 1 gal/animal.	0 days. Make second application 10-14 days later. Do not retreat within 7 days.
Lice reach $\frac{1}{16}$ to $\frac{1}{8}$ inch in length. Biting lice are flattened and yellowish to reddish in color. Sucking lice are oval and bluish gray.		Co-Ral 25% WP (coumaphos)	Lice: 2 lb/100 gal water. Keds: 4 lb/100 gal water.	15 days. Do not treat lambs less than 3 months old.
		malathion 57% EC	1 gal/100 gal water.	0 days. Do not treat lambs less than 1 month old.
		diazinon 50% WP	0.5 lb/100 gal water. Use 1 gal/animal.	14 days. Use high pressure and volume. Do not treat lambs less than 2 weeks old.
		Marlate 50% WP (methoxychlor)	8 lb/100 gal water. Spray each animal thoroughly.	0 days.
	Dust	Co-Ral 0.5% D	Follow label directions.	15 days. Treat once after shearing. Do not treat lambs less than 3 months old.
		diazinon 2% D	1½ oz/animal.	14 days. Do not treat lambs less than 2 weeks old.
		malathion 4-5% D	1-2 oz/animal.	0 days. Repeat application in 2-3 weeks if needed. Do not treat lambs less than 1 month old.
		Marlate 50% WP (methoxychlor)	1 tbsp/animal.	0 days. Treat only once.

Sheep, continued

Pest	Treatment method	Insecticide and formulation	Dilution and rate	Preslaughter interval, restrictions, comments
WOOL MAGGOTS	Spray	Reduce wool maggot attacks by tagging sheep (shearing under the tail and between the hind legs), docking, and castrating before May. Practice good sanitation. Shear around and direct sprays to the infested areas.		
Cream-colored maggots are larvae of blow flies. Maggots live in wet, matted wool near the rear of the animal and in matted wool surrounding wounds.		Co-Ral 25% WP (coumaphos)	4 lb/100 gal water. Use 1 gal/animal.	15 days. Do not treat lambs less than 3 months old.
		diazinon 50% WP	0.5 lb/100 gal water. Use 1 gal/animal.	14 days. Do not treat lambs less than 2 weeks old.
SCAB MITES (SCABIES, WET MANGE)		Sheep scab is a quarantinable disease. Infested animals shed wool; skin becomes roughened and crusted. Where infestations are suspected, contact the Illinois Department of Agriculture, Bureau of Animal Health, Illinois State Fairgrounds, Springfield, Illinois 62706, 217/782-4944.		
HORN FLIES (NHE 59)	Spray	Co-Ral 25% WP (coumaphos)	2 lb/100 gal water.	15 days. Do not treat lambs less than 3 months old.
		Marlate 50% WP (methoxychlor)	2 lb/100 gal water.	0 days. Repeat treatment every 3 weeks as needed.
FACE FLIES (NHE 106)	Spray	pyrethrin (0.05-0.10%) plus synergist (0.5-1.0%)	1-2 fl oz/animal.	0 days. Apply daily to head, neck, and front legs as a fine mist. Do not wet hair or skin.

Goats

Pest	Treatment method	Material and formulation	Dilution and rate	Preslaughter interval, restrictions, comments
LICE (NHE 53)	Spray	Ciovap 12.5% EC (crotoxyphos plus dichlorvos)	2 gal/100 gal water. Use 2-4 qt/animal.	0 days. Make second application 14 days after first. Do not apply more often than every 7 days. Do not contaminate feed, water, milk, or milking equipment.
FACE FLIES (NHE 106), HORN FLIES (NHE 59), STABLE FLIES (NHE 61)	Spray	Ciovap 12.5% EC (crotoxyphos plus dichlorvos)	1 qt/3 gal water. Use 1 pt/animal/week.	0 days. Do not apply more often than every 7 days. Do not contaminate feed, water, milk, or milking equipment.
HORSE FLIES, DEER FLIES (NHE 60)	Spray	pyrethrin (0.05-0.10%) plus synergist (0.5-1.0%)	1-2 fl oz/animal.	0 days. Apply to head, neck, and front legs as a fine mist. Do not wet hair or skin.

Poultry

Pest	Treatment method	Material and formulation	Dilution and rate	Preslaughter interval, restrictions, comments
LICE, NORTHERN FOWL MITES (BIRD TREATMENT) (NHE 54) Chicken lice are flat-bodied, straw-colored, $\frac{1}{16}$ -inch-long lice with chewing mouth-parts. They feed on feathers and skin flakes, irritating birds. Severe infestations reduce egg production.	Spray	Co-Ral 25% WP (coumaphos)	Lice: 6 oz/5 gal water. Mites: 3 oz/5 gal water. Use 1 gal/100-125 birds, or 0.5 fl oz/bird.	0 days. Do not treat more than once per week. Do not treat within 10 days of vaccination or stress.
		Ectiban 5.7% EC (permethrin)	1 qt/25 gal water. Use 1 gal/100 birds.	0 days. Treat vent area thoroughly.
		malathion 57% EC	1 fl oz/gal water. Use 1 gal/100-125 birds.	0 days. Repeat treatment in 4-8 weeks or when necessary.
		Rabon 50% WP (stirofos)	6.5 oz/5 gal water. Use 1 gal/100 birds or 1 fl oz/bird using at least 100-125 psi.	0 days. Do not treat more than once every 14 days.
		Ravap 28.7% EC Poultry Spray and Larvicide (stirofos + dichlorvos)	1 pt/6 gal water. Use 1 gal/100 birds or 1 fl oz/bird using at least 100-125 psi.	0 days. Do not treat more than once every 14 days.
		Sevin 50% WP or 80% SP (carbaryl)	6 oz 50% WP or 4 oz 80% SP/5 gal water. Use 1 gal/100 birds.	7 days. Repeat treatment in 4 weeks if necessary.
Northern fowl mites are dark red to black blood feeders that build up in the vent area. Mature mites are roughly $\frac{1}{25}$ inch long. Feathers around the vent appear grayish or black from accumulation of mites, mite eggs, and excrement. Severe infestations reduce egg production and can cause death. Northern fowl mites are most troublesome in winter.	Dust	Ectiban 0.25% D (permethrin)	Use 1 lb/100 birds.	0 days. Apply with shaker or hand duster. Treat vent area thoroughly.
		malathion 4-5% D	Use 1 lb/100 birds.	0 days. Apply with shaker or hand duster.
		Rabon 3% D (stirofos)	Use 1 lb/300 birds.	0 days. Apply with hand or power duster. Do not treat more than once every 14 days.
		Sevin 5% D (carbaryl)	Use 1 lb/100 birds.	7 days. Apply with shaker or hand duster. Do not treat more than once every 4 weeks.
LICE, CHICKEN MITES, NORTHERN FOWL MITES (POULTRY HOUSE AND LITTER TREATMENT) (NHE 54) Chicken mites (or roost mites) are bright to dark red and $\frac{1}{25}$ inch long. They hide in cracks and crevices during the day and feed on birds at night. They are most prevalent in spring, summer, and fall, not in winter.	Spray	Co-Ral 25% WP (coumaphos)	6 oz/5 gal water. Use 1 gal/1,000 sq ft.	0 days. Apply thoroughly to litter, walls, ceilings, floors, roosts, nests, and adjacent areas. Force spray into all cracks and crevices.
		malathion 57% EC	2 fl oz/gal water. Use 1 gal/1,000 sq ft.	0 days. Apply liberally to litter, walls, ceilings, floors, roosts, nests, and adjacent areas. Force spray into cracks and crevices.
		Rabon 50% WP (stirofos)	0.5 lb/6 gal water. Use 1-2 gal/1,000 sq ft.	0 days. Apply thoroughly to litter, walls, roosts, cracks, crevices, and interiors.
		Ravap 28.7% EC Poultry Spray and Larvicide (stirofos + dichlorvos)	1 pt/6 gal water. Use 1-2 gal/1,000 sq ft.	0 days. Apply thoroughly to litter, walls, roosts, cracks, and crevices.
		Sevin 50% WP or 80% SP (carbaryl)	2 lb 50% WP or 1.5 lb 80% SP/5 gal water. Use 1-2 gal/1,000 sq ft.	7 days. Apply spray to walls, bedding, litter, and roosts. Force spray into cracks and crevices. Repeat as needed. Avoid contamination of nests, eggs, feed, and water.

Poultry, continued

Pest	Treatment method	Insecticide and formulation	Dilution and rate	Preslaughter interval, restrictions, comments
LICE, CHICKEN MITES, NORTHERN FOWL MITES (POULTRY HOUSE AND LITTER TREATMENT), cont.	Dust	malathion 4-5% D	1 lb/50-60 sq ft.	0 days. Apply liberally to litter, walls, ceilings, roosts, nests, and adjacent areas.
		Rabon 3% D or 50% WP (stirofos)	1 lb 3% D or 2.5 oz 50% WP/100 sq ft.	0 days. Treat litter evenly and thoroughly.
		Sevin 5% D (carbaryl)	1 lb/40 sq ft.	7 days. Apply to litter, roosts, and adjacent areas. Do not apply to eggs or nests. Do not treat more than once every 4 weeks.
DARKLING BEETLES (LESSER MEALWORMS) Cream-colored larvae infest decaying organic matter or moldy feeds. They are ingested and survive long enough to bite and damage the alimentary canal.	Spray	Rabon 50% WP (stirofos)	2 lb/25 gal water. Use 1-2 gal/1,000 sq ft.	0 days. Apply evenly and thoroughly to litter, walls, center posts, and foundation walls.
		Sevin 80% SP or 40% or 43.4% suspensions (carbaryl)	62.5 lb 80% SP or 50 qt 40% or 43.4% suspensions/100 gal water. Use 2 gal/1,000 sq ft.	7 days. Apply evenly and thoroughly to litter or floor surface. Do not apply directly to poultry, nests, or eggs. Repeat as needed.
	Dust	Sevin 5% D (carbaryl)	1 lb/40 sq ft.	7 days. Do not apply to eggs or nest litter. Do not treat more than once every 4 weeks.
BED BUGS Flat, reddish brown, blood-sucking insects that feed at night. Rarely seen on birds during daylight.	Spray	Sevin 50% WP, 80% SP, or 40% or 43.4% suspensions (carbaryl)	8 lb 50% WP, 5 lb 80% SP, or 4 qt 40% or 43.4% suspensions/100 gal water. Use 1-2 gal/1,000 sq ft.	7 days. Apply thoroughly to walls, litter, and roost surfaces. Force spray into cracks and crevices. Do not apply directly to poultry, nests, or eggs. Repeat as needed.
	Dust	Sevin 5% D (carbaryl)	1 lb/40 sq ft.	7 days. Apply evenly to litter. Do not treat more than once every 4 weeks. Do not apply to eggs or nest.
HOUSE FLIES, BLOW FLIES (NHE 16, NHE 88) Flies that develop in chicken manure, waste feed, and carcasses are a general annoyance and can transmit diseases among birds and mammals.		Fly larvae develop in wet, decaying organic matter. Sanitation reduces the number of flies in a poultry house by eliminating fly breeding areas. Weekly removal of manure during the active fly breeding season depresses fly populations because maggots do not have enough time to develop into adults. Removing manure occasionally or under one row of cages at a time are alternatives to complete weekly removal. Partial or occasional removal promotes the establishment of fly parasites and predators, thus enhancing biological control. However, occasional insecticide treatments may be necessary. Spread manure thinly over fields and do not pile wastes outside the poultry house.		
	Mist blower or fogger	Ectiban 5.7% EC (permethrin)	<i>Misting:</i> Use 4 fl oz/1,000 sq ft. <i>Overhead system:</i> 1 qt/12.5 gal diesel or mineral oil. Use 4 fl oz/1,000 cu ft.	0 days. Do not treat manure or litter. Retreat as needed but not more often than once every 2 weeks. 0 days. Nozzles should be directed away from poultry.
		Vapona 23.4% EC (dichlorvos)	1 gal/25 gal water. Use 1 qt/8,000 cu ft. Daily use is necessary when used alone.	0 days. Do not apply directly to poultry. Reduce air movement. Avoid contamination of feed and water.
		pyrethrin (0.1%) plus synergist	Apply as directed on container.	0 days. Space spray for quick knockdown.

Poultry, continued

Pest	Treatment method	Insecticide and formulation	Dilution and rate	Preslaughter interval, restrictions, comments
HOUSE FLIES, BLOW FLIES, cont.	Residual wall spray	Baytex 45% EC (fenthion)	3 qt/25 gal water. Use 1 gal/500 sq ft.	0 days. Do not apply directly to poultry. Avoid contamination of feed and water.
		Ectiban 25% WP or 5.7% EC (permethrin); Atroban, Insectrin, Over-time, and Permethrin are additional permethrin formulations with state labels for use as residual wall sprays.	6 oz 25% WP/11 gal water or 1 qt 5.7% EC/12.5 gal water. Use 1 gal/750 sq ft. Direct 4 fl oz 5.7% EC (undiluted)/1,000 sq ft with a mist sprayer.	0 days. Do not apply directly to poultry. Avoid contamination of feed and water. Do not treat manure. Retreat as needed, but not more than once every 2 weeks.
		Rabon 50% WP (stirofos)	4-8 lb/25 gal water. Use 1 gal/500-1,000 sq ft.	0 days. Avoid contamination of feed and water.
		Ravap 28.7% EC Poultry Spray and Larvicide (stirofos + dichlorvos)	1 gal/25 gal water. Use 1 gal/500-1,000 sq ft.	0 days. Avoid contamination of feed and water.
		Vapona 23.4% EC (dichlorvos)	1 gal/25 gal water. Use 1 qt/1,000 sq ft.	0 days. Do not apply directly to poultry. Avoid contamination of feed and water.
Bait		Dipterex 1% Dry (trichlorfon)	4 oz/1,000 sq ft.	0 days. Place in areas where flies congregate during the day. Do not place in areas where birds can come in contact with bait or where bait can contaminate feed or water.
		Golden Malrin 1% Dry Bait (methomyl)	0.25 lb/1,000 sq ft.	0 days. Use only on the walkways of caged layer houses. Place in areas where flies congregate during the day. Do not place in areas where birds can come in contact with bait or where bait can contaminate feed or water.
		Vapona 0.5% Dry (dichlorvos)	0.25 lb/1,000 sq ft.	0 days. Place in areas where flies congregate during the day. Do not place in areas where birds can come in contact with bait or where bait can contaminate feed or water.
Fly strip		Vapona Strips (dichlorvos)	Suspend 1 strip/1,000 cu ft.	0 days. Doors and windows must be closed so that vapors can build up to recommended levels. Do not hang near light bulbs or within reach of animals.
Manure drench		Use manure drenches to kill fly larvae developing in feces. Do not treat more than once every 7-10 days or apply where animals or birds will contact treated manure. Do not apply treated manure to crops not listed on the insecticide label.		
		Cygon 23.4% EC (dimethoate)	0.5 pt/5 qt water. Apply as a coarse spray.	0 days.
		Rabon 50% WP or 24% EC (stirofos)	4 lb 50% WP or 1 gal 24% EC/25 gal water. Use 1 gal/100 sq ft manure.	0 days.
		Ravap 28.7% EC Poultry Spray and Larvicide (stirofos + dichlorvos)	1 gal/25 gal water. Use 1 gal/100 sq ft manure.	0 days.
		Vapona 23.4% EC (dichlorvos)	1 gal/25 gal water. Use 1 gal/100 sq ft manure.	0 days.

Horses

Pest	Treatment method	Material and formulation	Dilution and rate	Preslaughter interval, restrictions, comments
MANGE MITES Burrowing in skin causes pain and itching. Most prevalent in winter.	Spray	lindane 25% WP	0.75 lb/50 gal water. Use 2 qt/animal.	60 days. Repeat in 7-10 days.
LICE $\frac{1}{16}$ to $\frac{1}{8}$ inch in length. Biting lice are yellow to red. Sucking lice are brownish to blue-gray. Head and neck, withers, and tailhead develop a scurfy appearance. Rubbing may create raw areas.	Spray	Co-Ral 25% WP or 11.6% EC (coumaphos) malathion 57% EC or 25% WP	0.5 lb 25% WP or 1 pt 11.6% EC/25 gal water. Treat animal thoroughly. 6.5-10 fl oz 57% EC or 0.75 lb 25% WP/5 gal water. Treat animal thoroughly.	0 days. 0 days.
TICKS Seldom a problem unless horses graze in brushy or wooded areas.	Spray	Co-Ral 25% WP or 11.6% EC (coumaphos) malathion 57% EC or 25% WP	1 lb 25% WP or 1 qt 11.6% EC/25 gal water. Treat animal thoroughly. 6.5-10 fl oz 57% EC or 0.75 lb 25% WP/5 gal water. Treat animal thoroughly.	0 days. Repeat as necessary. 0 days.
HORSE BOTS Flies are nearly as large as honey bees. They deposit eggs on the forelegs, throat, or muzzle area; fly activity severely annoys horses. Eggs are ingested; larvae (bots) develop within the horse's alimentary canal.	Feed additive Oral paste Injection Preventive spray	Anthon 90% Powder (trichlorfon) Horse Wormer (dichlorvos) Eqvalan 1.87% (ivermectin) Consult with a veterinarian for treatment with carbon disulfide, dichlorvos (Equigard), or piperazine + carbon disulfide (Parvex Plus).	5 g/250 lb body weight mixed with feed. Treat from mid-October to mid-December. 19.5 g/300 lb body weight mixed with feed. Give to individual horse in half its normal grain ration. Ready to use. Follow directions on prefilled syringe.	Nonfood use. Repeat after 3 to 4 months. Withdraw all feed 12-18 hours prior to and 3 hours after treatment. Do not treat colts under 4 months of age, mares in the last month of gestation, or horses to be used for food. Nonfood use. Treat 30 days after killing frost. Withhold water 4-6 hours before and 3 hours after consumption of the medicine. Do not treat sick animals or animals that have received tranquilizing drugs or other worm medicines within 1 week of application. Nonfood use.
	malathion 57% EC	During fall months, sponge legs, under jaw, and chest of animal with a warm 0.5% malathion solution.	0 days. Eggs will be stimulated to hatch and the larvae will be prevented from burrowing into the animal. Retreat when more eggs accumulate. Do not use bare hands; use specially prepared gloves or rubber gloves.	

Horses, continued

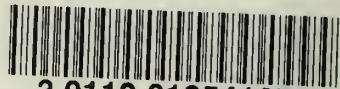
Pest	Treatment method	Insecticide and formulation	Dilution and rate	Preslaughter interval, restrictions, comments
SCREWWORMS, BLOW FLIES	Spray	Co-Ral 25% WP (coumaphos)	1.3 oz/gal water. Treat wound lightly but thoroughly.	0 days.
Maggots develop in wounds.	Dust	Co-Ral 25% D (coumaphos)	Ready to use. Treat wound lightly but thoroughly.	0 days.
HOUSE FLIES, STABLE FLIES		Sanitation is essential to reduce the number of flies around horse barns. Chemical treatments without good sanitation will not control flies. Remove moist straw, manure, hay, and spilled feed once or twice a week from within and around the stable or barn.		
House flies (NHE 16) develop in any moist, decaying organic matter. They annoy animals and humans and can transmit diseases.	Residual wall spray	Baytex 45% EC (fenthion)	3 qt/25 gal water. Use 1 gal/1,000 sq ft.	0 days. Do not apply directly to livestock. Avoid contamination of feed and water.
		Cygon 23.4% EC (dimethoate)	1 gal/25 gal water. Use 1-2 gal/1,000 sq ft.	0 days. Remove all animals before spraying buildings. Do not apply directly to livestock. Avoid contamination of feed and water.
Stable flies (NHE 61) resemble house flies but have a bayonetlike proboscis that protrudes from the front of the head. They are blood feeders that often attack lower portions of the front legs.		Ectiban 25% WP or 5.7% EC (permethrin); Atroban, Insectrin, Over-time, and Permethrin are additional permethrin formulations with state labels for use as residual wall sprays.	6 oz 25% WP/11 gal water or 1 qt 5.7% EC/12.5 gal water. Use 1 gal/750 sq ft. Direct 4 fl oz 5.7% EC (undiluted)/1,000 sq ft with mist sprayer.	0 days. Do not apply directly to livestock. Avoid contamination of feed and water.
		Rabon 50% WP (stirofos)	4-8 lb/25 gal water. Use 1 gal/500-1,000 sq ft.	0 days. Do not apply directly to livestock. Avoid contamination of feed and water.
		Ravap 28.7% EC (stirofos + dichlorvos)	1 gal/25 gal water. Use 1 gal/500-1,000 sq ft.	0 days. Do not apply directly to livestock. Avoid contamination of feed and water.
HORN FLIES (NHE 59)	Spray	Co-Ral 25% WP or 11.6% EC (coumaphos)	0.5 lb 25% WP or 1 pt 11.6% EC/25 gal water. Treat animal thoroughly.	0 days.
Horn flies are smaller than house flies but are similarly marked. They are blood feeders that congregate on the back and shoulders. They move to the belly and the shaded side of the animal on hot days.		malathion 57% EC or 25% WP	6.5-10 fl oz 57% EC or 0.75-1.25 lb 25% WP/5 gal water. Treat animal thoroughly.	0 days.
		Ectrin 10% WDL (fenvalerate)	4 fl oz/3 gal water. Mist 8 fl oz spray per animal. Direct at face, head, shoulders, and legs.	Do not treat animals intended for slaughter.
		Rabon 1% Spray-n-Wipe (stirofos)	Apply 1-2 fl oz to flanks, belly, and back.	0 days.
	Dust	Co-Ral 1% D (coumaphos)	2 oz/animal.	0 days. Apply to the head, neck, shoulders, back, and tailhead. Repeat as needed.
		malathion 4% D	4 tbsp/animal.	0 days. Apply evenly along back line. Repeat at 10-14 day intervals.

Horses, continued

Pest	Treatment method	Insecticide and formulation	Dilution and rate	Preslaughter interval, restrictions, comments
FACE FLIES, STABLE FLIES, HORSE FLIES, DEER FLIES, BLACK FLIES, MOSQUITOES	Spray	Ectrin 10% WDL (fenvalerate)	4 fl oz/3 gal water. Mist 8 fl oz spray per animal. Direct at face, head, shoulders, and legs.	Do not treat animals intended for slaughter.
		pyrethrin (0.1%) plus synergist	1-2 fl oz/animal.	0 days. Apply as a mist spray. Do not wet the hide. Repeat as needed.
		Rabon 1% Spray-n-Wipe (stirofos)	1-2 fl oz/animal.	0 days. Apply to flanks, belly, and back.
	Gel wipe-on	Rabon 2% Gel Wipe-on (stirofos)	1-2 fl oz/animal.	0 days. Apply as directed every 2-3 days if needed.



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